



1. Description

1.1. Project

Project Name	mgmt
Board Name	custom
Generated with:	STM32CubeMX 6.8.0
Date	04/29/2023

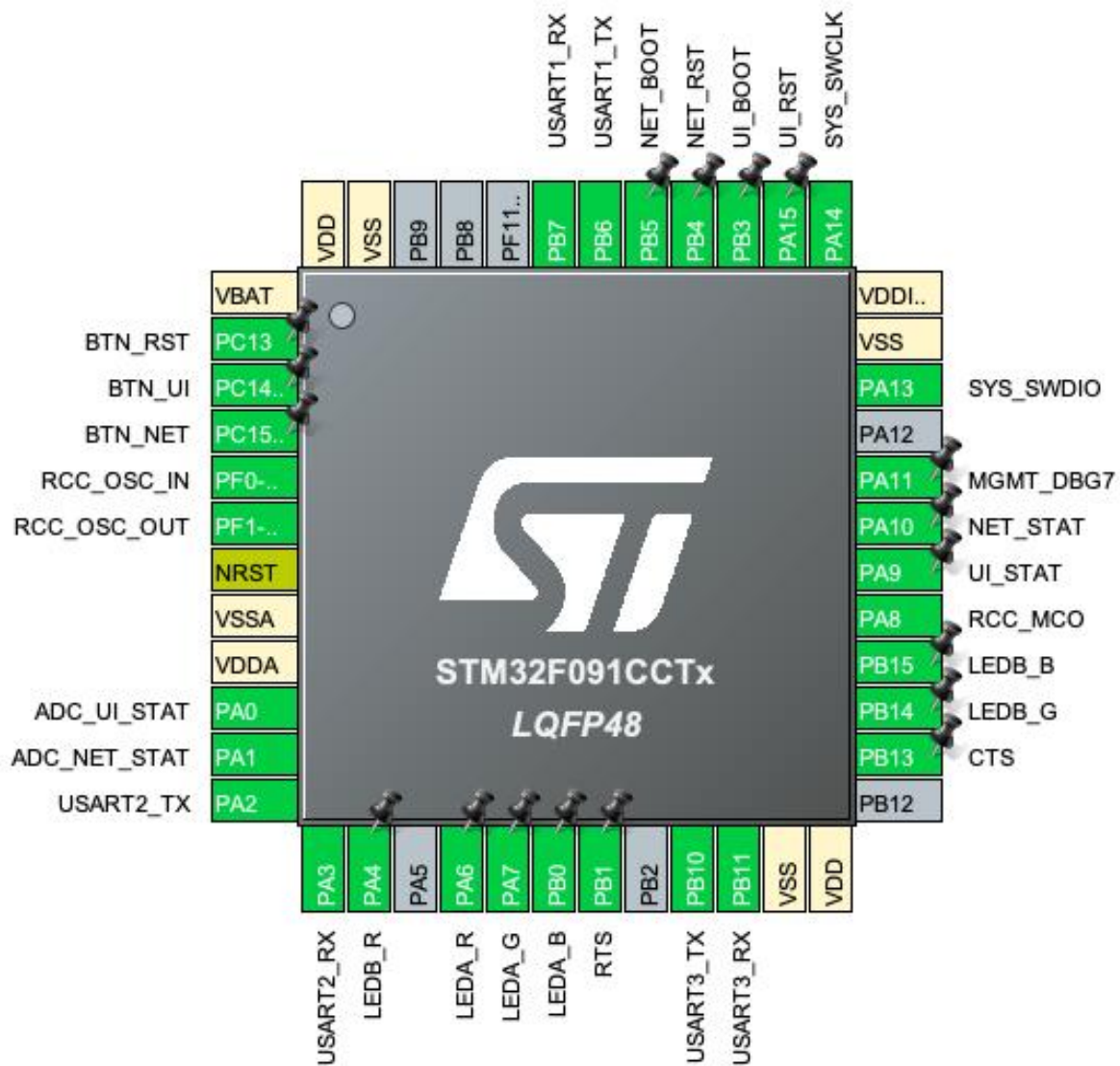
1.2. MCU

MCU Series	STM32F0
MCU Line	STM32F0x1
MCU name	STM32F091CCTx
MCU Package	LQFP48
MCU Pin number	48

1.3. Core(s) information

Core(s)	Arm Cortex-M0
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2. Pinout Configuration



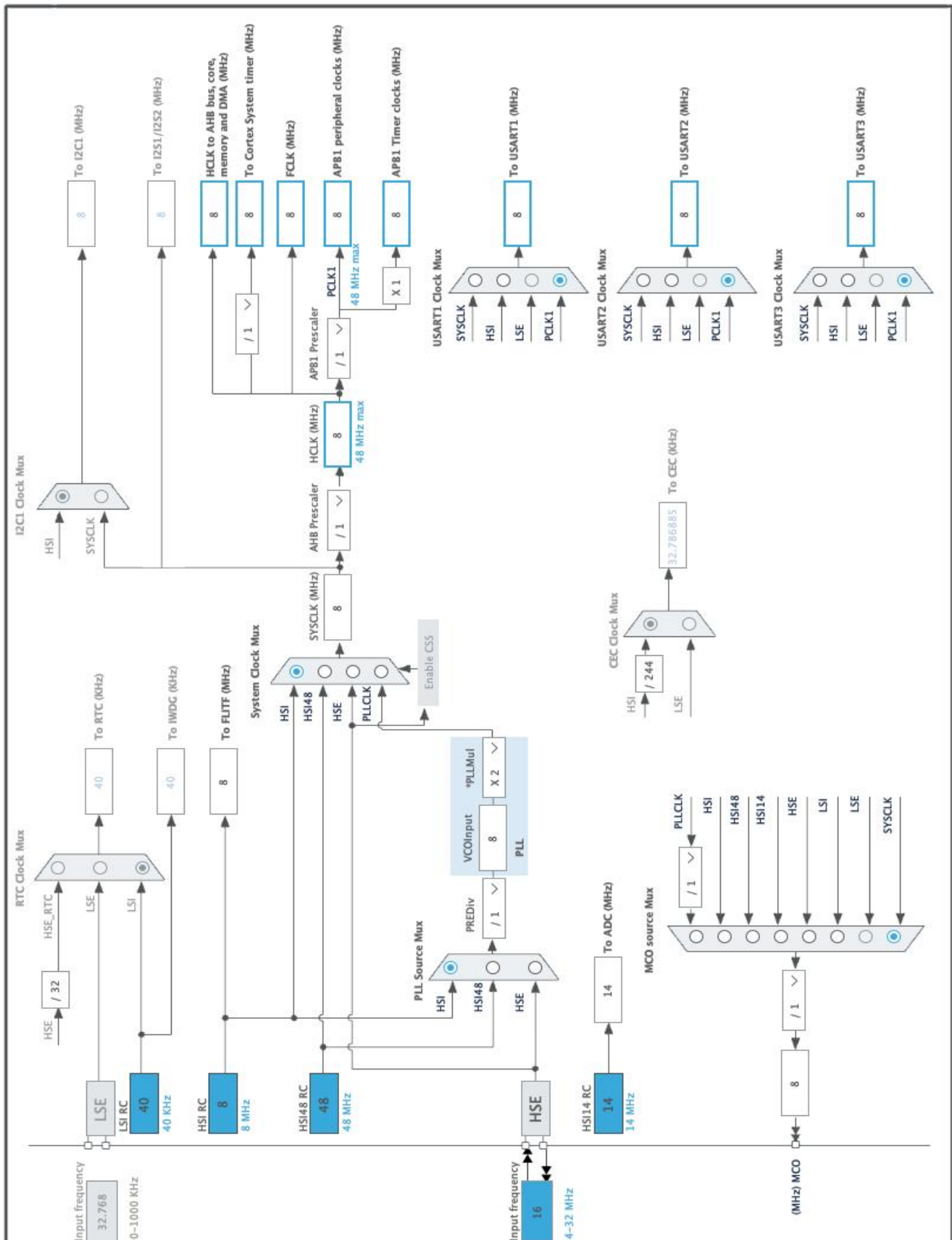
3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13 *	I/O	GPIO_Input	BTN_RST
3	PC14OSC32_IN *	I/O	GPIO_Input	BTN_UI
4	PC15OSC32_OUT *	I/O	GPIO_Input	BTN_NET
5	PF0-OSC_IN	I/O	RCC_OSC_IN	
6	PF1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	VSSA	Power		
9	VDDA	Power		
10	PA0	I/O	ADC_IN0	ADC_UI_STAT
11	PA1	I/O	ADC_IN1	ADC_NET_STAT
12	PA2	I/O	USART2_TX	
13	PA3	I/O	USART2_RX	
14	PA4 *	I/O	GPIO_Output	LEDB_R
16	PA6 *	I/O	GPIO_Output	LEDA_R
17	PA7 *	I/O	GPIO_Output	LEDA_G
18	PB0 *	I/O	GPIO_Output	LEDA_B
19	PB1 *	I/O	GPIO_Input	RTS
21	PB10	I/O	USART3_TX	
22	PB11	I/O	USART3_RX	
23	VSS	Power		
24	VDD	Power		
26	PB13 *	I/O	GPIO_Input	CTS
27	PB14 *	I/O	GPIO_Input	LEDB_G
28	PB15 *	I/O	GPIO_Input	LEDB_B
29	PA8	I/O	RCC_MCO	
30	PA9 *	I/O	GPIO_Input	UI_STAT
31	PA10 *	I/O	GPIO_Input	NET_STAT
32	PA11 *	I/O	GPIO_Output	MGMT_DBG7
34	PA13	I/O	SYS_SWDIO	
35	VSS	Power		
36	VDDIO2	Power		
37	PA14	I/O	SYS_SWCLK	
38	PA15 *	I/O	GPIO_Output	UI_RST
39	PB3 *	I/O	GPIO_Output	UI_BOOT
40	PB4 *	I/O	GPIO_Output	NET_RST

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
41	PB5 *	I/O	GPIO_Output	NET_BOOT
42	PB6	I/O	USART1_TX	
43	PB7	I/O	USART1_RX	
47	VSS	Power		
48	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	mgmt
Project Folder	/Users/fluffy/src/hactar/firmware/mgmt
Toolchain / IDE	EWARM V8.32
Firmware Package Name and Version	STM32Cube FW_F0 V1.11.4
Application Structure	Advanced
Generate Under Root	No
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	Copy all used libraries into the project folder
Generate peripheral initialization as a pair of '.c/.h' files	No
Backup previously generated files when re-generating	No
Keep User Code when re-generating	Yes
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No
Enable Full Assert	No

5.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_ADC_Init	ADC
4	MX_TIM3_Init	TIM3
5	MX_TIM7_Init	TIM7
6	MX_USART1_UART_Init	USART1
7	MX_USART2_UART_Init	USART2
8	MX_USART3_UART_Init	USART3

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F0
Line	STM32F0x1
MCU	STM32F091CCTx
Datasheet	DS10312_Rev4

6.2. Parameter Selection

Temperature	25
Vdd	3.6

6.3. Battery Selection

Battery	Li-SOCL2(A3400)
Capacity	3400.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	100.0 mA
Max Pulse Current	200.0 mA
Cells in series	1
Cells in parallel	1

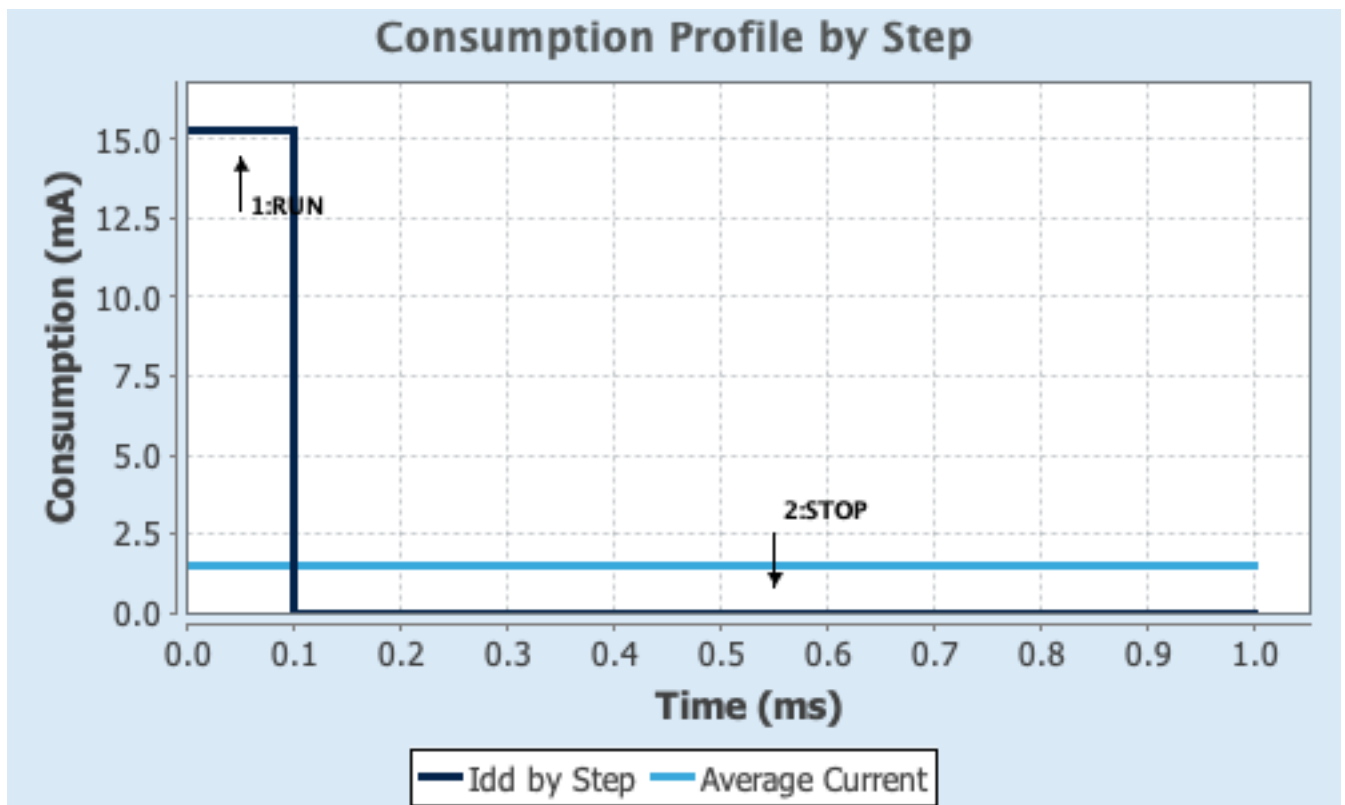
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.6	3.6
Voltage Source	Battery	Battery
Range	No Scale	No Scale
Fetch Type	FLASH	n/a
CPU Frequency	48 MHz	0 Hz
Clock Configuration	HSE PLL	Regulator LP
Clock Source Frequency	8 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	15.27 mA	7 μ A
Duration	0.1 ms	0.9 ms
DMIPS	0.0	0.0
Ta Max	102.03	105
Category	In DS Table	In DS Table

6.5. Results

Sequence Time	1 ms	Average Current	1.53 mA
Battery Life	3 months, 22 hours	Average DMIPS	0.0 DMIPS

6.6. Chart



7. Peripherals and Middlewares Configuration

7.1. ADC

mode: IN0

mode: IN1

7.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Asynchronous clock mode
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Forward
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	Disabled
Low Power Auto Power Off	Disabled

ADC_Regular_ConversionMode:

Sampling Time	1.5 Cycles
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None

WatchDog:

Enable Analog WatchDog Mode	false
Low Threshold	0

7.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

mode: Master Clock Output

7.2.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	0 WS (1 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
HSI14 Calibration Value	16

HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

7.3. SYS

mode: Debug Serial Wire

Timebase Source: SysTick

7.4. TIM3

Trigger Source: ITR0

7.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	48000 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable
Slave Mode Controller	Slave mode disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

7.5. TIM7

mode: Activated

7.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	48 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	1000 *
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)
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7.6. USART1

Mode: Asynchronous

7.6.1. Parameter Settings:

Basic Parameters:

Baud Rate	57600 *
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

7.7. USART2

Mode: Asynchronous

7.7.1. Parameter Settings:

Basic Parameters:

Baud Rate	57600 *
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
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TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

7.8. USART3

Mode: Asynchronous

7.8.1. Parameter Settings:

Basic Parameters:

Baud Rate	57600 *
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

* User modified value

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC	PA0	ADC_IN0	Analog mode	No pull-up and no pull-down	n/a	ADC_UI_STAT
	PA1	ADC_IN1	Analog mode	No pull-up and no pull-down	n/a	ADC_NET_STAT
RCC	PF0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PF1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
	PA8	RCC_MCO	Alternate Function Push Pull	No pull-up and no pull-down	Low	
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
USART1	PB6	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB7	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PA3	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
USART3	PB10	USART3_TX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB11	USART3_RX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
GPIO	PC13	GPIO_Input	Input mode	Pull-up *	n/a	BTN_RST
	PC14OSC32_IN	GPIO_Input	Input mode	Pull-up *	n/a	BTN_UI
	PC15OSC32_OUT	GPIO_Input	Input mode	Pull-up *	n/a	BTN_NET
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LEDB_R
	PA6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LEDA_R
	PA7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LEDA_G
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LEDA_B
	PB1	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	RTS
	PB13	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CTS
	PB14	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	LEDB_G
	PB15	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	LEDB_B
	PA9	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	UI_STAT
	PA10	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	NET_STAT
	PA11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	MGMT_DBG7
	PA15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	UI_RST
	PB3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	UI_BOOT
	PB4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	NET_RST
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	NET_BOOT

8.2. DMA configuration

nothing configured in DMA service

8.3. NVIC configuration

8.3.1. NVIC

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	3	0
TIM7 global interrupt	true	0	0
PVD and VDDIO2 supply comparator interrupts through EXTI lines 16 and 31	unused		
Flash global interrupt	unused		
RCC and CRS global interrupts	unused		
ADC and COMP interrupts (COMP interrupts through EXTI lines 21 and 22)	unused		
TIM3 global interrupt	unused		
USART1 global interrupt / USART1 wake-up interrupt through EXTI line 25	unused		
USART2 global interrupt / USART2 wake-up interrupt through EXTI line 26	unused		
USART3 to USART8 global interrupts / USART3 wake-up interrupt through EXTI line 28	unused		

8.3.2. NVIC Code generation

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
System service call via SWI instruction	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
TIM7 global interrupt	false	true	true

* User modified value

9. System Views

9.1. Category view

9.1.1. Current

Middleware

System Core

Analog

Timers

Connectivity

Multimedia

Computing

DMA

ADC 

TIM3 

USART1 

GPIO 

TIM7 

USART2 

NVIC 

USART3 

RCC 

SYS 

10. Docs & Resources

Type	Link
IBIS models	https://www.st.com/resource/en/ibis_model/stm32f0_ibis.zip
System View	https://www.st.com/resource/en/svd/stm32f0_svd.zip
Description	
IBIS models	https://www.st.com/resource/en/ibis_model/stm32f0_ibis.zip
System View	https://www.st.com/resource/en/svd/stm32f0_svd.zip
Description	
Presentations	https://www.st.com/resource/en/product_presentation/gt_stm32f0-io.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_eval-tools_portfolio.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32-usb-c-pd-solutions-presentation.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_software_development_tools.pdf
Training Material	https://www.st.com/resource/en/sales_guide/sg_sc2155.pdf
Brochures	https://www.st.com/resource/en/brochure/breveco0518.pdf
Brochures	https://www.st.com/resource/en/brochure/brstm32f0.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32nucleo.pdf
Flyers	https://www.st.com/resource/en/flyer/flstmcsuite.pdf
Flyers	https://www.st.com/resource/en/flyer/fldpstpfc11120.pdf
Product	https://www.st.com/resource/en/certification_document/stm32_authentication_can.pdf
Certifications	
Application Notes	https://www.st.com/resource/en/application_note/an1181-electrostatic-discharge-sensitivity-measurement-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an1709-emc-design-

guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an2606-stm32-microcontroller-system-memory-boot-mode-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an2639-soldering-recommendations-and-package-information-for-leadfree-ecopack-mcus-and-mpus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an2834-how-to-get-the-best-adc-accuracy-in-stm32-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an2945-stm8s-and-stm32-mcus-a-consistent-832bit-product-line-for-painless-migration-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3070-managing-the-driver-enable-signal-for-rs485-and-iolink-communications-with-the-stm32s-usart-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3126-audio-and-waveform-generation-using-the-dac-in-stm32-products-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3155-usart-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf

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Application Notes https://www.st.com/resource/en/application_note/an3371-using-the-hardware-realtime-clock-rtc-in-stm32-f0-f2-f3-f4-and-l1-series-of-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3960-esd-considerations-for-touch-sensing-applications-on-mcus-stmicroelectronics.pdf

- Application Notes https://www.st.com/resource/en/application_note/an4013-stm32-crossseries-timer-overview-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4067-calibrating-stm32f0x1-stm32f0x2-and-stm32f0x8-lines-internal-rc-oscillators-stmicroelectronics.pdf
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- Application Notes https://www.st.com/resource/en/application_note/an4099-implementation-of-transmitters-and-receivers-for-infrared-remote-control-protocols-with-mcus-of-the-stm32f0-and-stm32f3-series-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4221-i2c-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
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- Application Notes https://www.st.com/resource/en/application_note/an4310-sampling-capacitor-selection-guide-for-touch-sensing-applications-on-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4312-design-with-surface-sensors-for-touch-sensing-applications-on-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4316-tuning-a-touch-sensing-application-on-mcus-stmicroelectronics.pdf
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& Software

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& Software

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& Software

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& Software

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